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ABSTRACT

Five adults with developmental disabilities participated in a keyboard skills training program employing color coded keys and typing drills. Through typing skills, the subjects were taught basic computer operations such as taking disk directories, loading programs and executing the programs. Repetitious learning was the model used. Data collected daily on words per minute and accuracy revealed consistent increases in mean typing speed with slight increases in accuracy. (CL)

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The Importance Of Keyboarding Skills In Computer Usage With The Handicapped

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Abstract

Today computers have become tools which influence innumerable aspects of life. Studies have shown how the computer is an excellent means of closing the learning gap between regular and special education students. While much talk concerns the valuable role that the computer can play as an instructional tool, the consensus seems to be that keyboarding skills are not given the time and attention they deserve. Five developmentally disabled individuals were able to achieve high levels of success using the computer as a work tool. The success is partly due to the keyboarding skills they possessed which allowed them to maximize the power of the computer.

Introduction

Studies (Goldstein, 1964; Heber and Dever, 1970) have pointed out that special education students are those who have the poorest acquisition of skills and who meet with tenuous occupational and social success as adults. It is often the case that when new technologies arise, handicapped individuals are often the last ones to be exposed to the innovation. This has somewhat been shown to be the case with computers. Given the evidence that in the future computers are likely to become tools for extending human intellect, influencing innumerable aspects of life, it is particularly important that these subjects are taught to use this tool to the best of their ability (Christensen and Cosden, 1986).

Studies of the use of computers in learning found that computer-assisted instruction was shown to be more effective for students of low ability than those with average or high ability (Kulik, Kulik, and Cohen, 1980); Halpern, 1984). Previous studies (Reith, Polsgrove, & Eckert, 1984; Rosengrant, 1985) explain how the computer

bridges the learning gap for students with handicaps; immediate feedback, constant attention, personalization and positive reinforcement provided by the computer create an ideal learning environment for persons with handicaps.

The computer can be a powerful machine which accomplishes tasks and extends a person's ability to work and learn. On the other hand the computer can become a very complex machine which seems impersonal and impossible to communicate with. Wetzel (1985), Stewart & Buford, (1983) Kisner, (1984) and others identified a lack of keyboarding skills as the heart of the problem related to an inability to effectively use the computer. Before people can do more writing, learning, or word processing which puts the computer's power to work for the operator, the common stumbling block of a lack of typing skills must be overcome (Craig & Switzer, 1983). Many research studies talk about the valuable role that computers can play as instructional tools but the concensus seems to be that keyboarding skills are not stressed enough. Without adequate keyboarding skills subjects waste valuable time searching for the right keys. With developmentally disabled individuals speed is an even greater concern and efficiency is of grave importance.

The "hunt and peck" form of typing is not suitable for applications which require long responses (Kisner, 1984). More importantly the ability to use a keyboard effectively gives the operator the feeling that he or she is in control of the machine, thus, increasing their self confidence in using the computer. Research in the area of perceived self concept and control (Purkey & Novak, 1984; Coombs, Avila, & Purkey, 1978); and Coopersmith, 1967) conclude that self

confidence is correlated with success. Perceived self confidence is the basic motive behind all human behavior and those high in their own self esteem approach tasks with the expectation that they will be well-received and successful. Success with prior experiences also develops motivation which is a key psychological element in the learning process (Witrock, 1979). Bandura (1977) states that the opinion of how one can perform a task directly affects how that person performs that task.

Keyboarding skills appears to be the basis for successful interaction with computers. The potential of the computer is great for increasing the learning and work possibilities of handicapped individuals. The ability to independently manipulate the computer will more than likely raise the developmentally disabled individual's faith in the ability to succeed. These reasons warrant that more time and effort be put into helping handicapped individuals obtain adequate keyboarding skills. The following is the description of a study which concentrated on teaching keyboarding as the basis from which other computer skills could be developed.

Method

The five subjects who took part in the study were certified as being developmentally disabled following the criteria set by the Hawaii Planning Council on Developmental Disabilities. They were three males and two females who ranged in age from twenty to thirty four. The primary disabilities of the subjects were mild mental retardation, Cerebral Palsy, Infantile Autism, and in one case a combination of disabilities. All of the subjects were at about the prevocational work activity level and would have been placed in sheltered workshops had they not taken part in this study. None of the

subjects had any previous computer or typing skills.

The training took place over a six month period with sessions being held for two hours, five days a week. Since the objective of the larger study was to employ the subjects in computer-related occupations, the training conditions simulated an actual office environment. A corner of an engineering firm's office was leased and contained five personal computers and a printer. One wall was covered with a large layout of the keyboard which had color coded keys. On the same wall was another poster which displayed two hands and colored dots on each finger. The subjects were told that the colors on the fingers could only press the same colored keys on the keyboard. The "correct" usage of the keyboard was deemed essential to long term success in using the computer as a work tool and was stressed throughout the training period. The basic premise was to have the subjects obtain adequate use of the keyboard so that transfer of information from the mind to the computer would be efficient. The transfer of information was deemed important so that as the subject developed an idea or solution to the problem, the idea would not be lost due to an inability to enter the information quickly and accurately.

The keyboarding skills part of the training initially took six weeks to accomplish; however, subsequent studies have completed it in a shorter period of time. Due to the experimental nature of the study, extra time was alloted during this phase of training to insure that the subjects acquired the appropriate skills in an attempt to prevent keyboard-related problems later in the study.

The subjects were taught parts of the computer and proper handling of equipment during the first week of the study. The initial

fear of computers was also eliminated through the use of games and simple graphics display programs which required pressing only the return key.

The typing drills consisted of ten individual typing exercises which were broken down according to the different parts of the keyboard. Each row of keys were introduced in two drills, one which had students pressing individual and groups of letters and the second was a more complex drill which contained actual words and short sentences. The subject was to type in exactly what appeared on the screen directly below each letter. The correct letter must have been entered before moving on to the next. A short musical segment and the time it took to complete the exercise was displayed at the end of the exercise.

The different typing drills were introduced at one week intervals. The order of introduction to the keyboard parts was determined by chronological use in introductory typing books. Accuracy was stressed throughout with speed being stressed only after adequate use of the entire keyboard was obtained.

The time of completion for each drill was automatically written to each student's disk and evaluated weekly. The typing test was introduced during the fourth week of training. The test evaluated students on speed and accuracy of their typing skills. In each of the tests, a paragraph or paragraphs appeared on the screen and the student was to type in the paragraph exactly as it appeared. Upon completion of the test, the number of words in the test, the length of time of completion, the number of words per minute and the accuracy were reported. A typing analysis which listed each letter that

was pressed, the number of times it was appropriately pressed, the number of times it was pressed in error and the average strike time was written to the disk.

Through typing skills, the subjects were taught basic computer operations such as taking disk directories, loading programs and executing the programs. Direction sheets breaking down procedures (formatting disks, starting the computer, etc.) into minute steps were developed to allow the subjects to work independently of the trainers. Repetitious learning was the model used due to its probability of success with the population of subjects involved. The typing drills and tests were used over the six month training period in hopes that repetition would increase correct keyboard usage.

Results

The data, collected daily from each of the subjects relative to typing (words per minute and accuracy) were collected for each individual subject first, then the group as a whole. The scores were grouped in one month intervals from which means and standard deviations for each measure were calculated. The means are presented in Table 1.

Table 1

Summary Statistics of Typing Speed and Accuracy

Month	Words Per Minute		Accuracy	
	Mean	S.D.	Mean	S.D.
1	10.17	1.82	74%	10%
2	11.16	1.96	81%	10%
3	15.30	1.07	75%	11%
4	17.52	1.44	84%	6%
5	19.10	1.82	86%	8%
6	22.93	2.61	88%	5%

The mean typing speed of subjects increased consistently throughout the six month training period. The biggest increase in typing speed occurred between the second and third months.

The mean typing accuracy was relatively consistent throughout the first three months of the training. The first and third months which had the lowest mean accuracy had high standard deviations. The last three months showed a slight increase in accuracy.

Discussion

The success that the subjects attained in achieving word processing and data entry skills which were taught later in the study can be attributed to the sound keyboarding skills that the subjects possessed. In order to attain maximal use of the power of the computer, time cannot be wasted trying to enter information or commands into the computer.

As computer-related problems arose, steps towards correcting the problem were taught in specific steps. In the early stages of the study, the subjects were able to cognitively obtain a solution but became frustrated by their inability to get the computer to do what they had intended. Once familiarity with the hardware was achieved, software related problems were more efficiently resolved.

Although data was not collected on education achievement, comments from the parents of the subjects and the trainers' observations concluded that the subjects ability to acquire new information increased at noticeable rates. The largest gain in typing speed occurred just after the subjects had attained the skills necessary to use the entire keyboard. At this point in time, the subjects also began to display greater levels of self confidence towards using the computer which carried over to their learning ability. It appears that the mastery of keyboard skills by persons with developmental disabilities is the basis for successful computer usage.

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